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March 26, 2011

David Bailey, Esq.  
The Environmental Law Group  
5803 Staples Mill Road  
Richmond, Virginia 23228

Re: Kristensen v. Spotnitz, Case No. 3:09-cv-00085  
United States District Court, Charlottesville, Virginia

Dear Mr. Bailey:

My name is R. Leonard Vance. I hold a Ph.D in Chemistry from the University of Virginia, a BS in Chemistry from Virginia Tech and a JD degree from the University of Richmond,. I am licensed by the Commonwealth of Virginia as a professional engineer. I am also certified by the corresponding national boards as a Certified Industrial Hygienist (CIH), a Certified Safety Professional(CSP), and a Certified Hazardous Materials Manager (CHMM). I also hold licenses in asbestos management and the possession and use of certain highly regulated chemicals not germane to this case. Relevant to mold and mold remediation, I teach a graduate course entitled Principles of Environmental Health that is required for graduation from the VCU Master of Public Health Program. I also teach a year long graduate course in industrial hygiene and a course entitled Environmental Chemistry. For over ten years, I performed mold investigations for the City of Richmond, and consulted with the City on mold programs and remediation. I have served as a mold consultant for the Richmond City Circuit, District, and J&D Courts, the Colonial Heights, Va., Circuit Court, and for school systems in the Cities of Richmond and Manassas, and for Botetourt County. I have directed and taught in a mold training program for schools during the summer in a dozen different locations around Virginia, sponsored jointly by USEPA, the Virginia Department of Health and the Virginia Department of Education. I also perform private mold consulting and I am a principal and officer in a mold laboratory accredited by the American Industrial Hygiene Association.

I have previously testified in Court for the parents of the named children in this case, was admitted as an expert in that case, and reviewed all documents in preparation for the prior case as well as in this case. Documents reviewed include all mold test results, photographs, depositions, discovery documents (in the prior case), and other expert reports (in the prior case).

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My opinions in this case relate to the presence of mold in the subject home, odors, the excessive water leaks and moisture conditions, which are now referred to as “damp indoor spaces;” the nature and types of molds found in the home and the potential health risks they represent, especially to children under the age of six years; and the general scientific literature at the time of the occurrence and as later developed in mold research on environmental and potential adverse health effects.

I hold the opinion, based on the photos, mold test results and the depositions of the parties, that the residence at 560 Blumfield Road was contaminated with excessive levels of mold and moisture conditions. Excessive levels of mold begin with “visible mold” on walls and interior areas. Under established federal guidance from EPA, see, *e.g.*, Mold Remediation in Schools and Commercial Buildings, EPA 402-K-01-001 (March 2001), if visible mold is present, then remediation and corrective action should begin, and sampling may be entirely unnecessary. (P. 25). It is enough that visible mold be present, especially if such mold, as here, is growing on interior walls as opposed to a common environment such as a shower stall. This is particularly important, again as here, when musty or damp odors are reported by the building occupants. These odors, which are fairly distinctive as to damp conditions and mold growth, are produced by mold proliferation and rotting building materials; the odors are generally caused by volatile organic compounds (VOCs) produced by the molds. Centers for Disease Control (CDC), Mold Prevention Strategies and Possible Health Effects in the Aftermath of Hurricanes and Major Floods, 2006, p. 3; EPA at 43.

When excessive moisture conditions accumulate in homes, mold growth will occur. EPA at 2; CDC, p. 4. Under moist conditions, mold growth is not limited to what is visible on the interior walls, but mold may be growing on hidden surfaces such as the backs of drywall, wall paper, paneling, carpet, or a plaster wall. In most cases of excessive water intrusion, as here, mold growth may occur in many different locations and produce elevated levels of mold spores and fragments in the air, where such mold can be inhaled. EPA at 8. Inhalation is the primary means of mold health injury except in limited occupational exposures.

Molds are allergenic, whether dead or alive, and some molds may be toxic. EPA at 17. All molds have the potential to cause health effects, and molds produce allergens, irritants, and in some cases toxins. EPA at 40, CDC, generally. It is well established that mold and the related moisture exposure conditions can cause irritation of the skin, eyes, throat and upper respiratory tract as well as allergic reactions. EPA at 40, 41. Although all molds are allergic, some types of mold have long been associated with adverse human health effects inside homes. Their presence is an outgrowth of long term moisture conditions. One particular mold, *Stachybotrys*, is known to be a slow growing organism which requires continuous or frequent water intrusion in order to survive. In this case, the occurrence of *Stachybotrys* on interior walls demonstrates a long term water problem, not a single or even an occasional water intrusion issue. In addition, the presence

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of *Aspergillus* and *Pencillium*, other molds of human health concern, also indicates an excessive water environment.

In addition to the water issues, levels of mold identified by air sampling also indicate excessive mold growths in the indoor air at the time of sampling. This is important because, compared to outside air, it indicates proof that mold is growing inside the home. A conventional way of evaluating indoor air quality involves the collection of mold samples both inside a building and outdoors next to the building. The presence of mold inside the building that is not present outside demonstrates indoor production of the mold. And the presence of significantly higher concentrations of a mold inside than those of the same mold outside is also taken as an indicator of the presence of an indoor source of contamination.

Using all mold testing available from the air, swabs and on the surface (tape lifts), I conclude that the subject home was contaminated with excessive levels of mold which were not normal and contained molds known to be allergenic and to have adverse human health effects. Further, because of the odors reported, the excessive moisture conditions in combination with mold and the reactions of the plaintiffs themselves, there were clearly VOCs in the air inside the home in sufficient quantities to cause irritation.

As to mold remediation and family property, including the children's belongings, I hold the view that there was sufficient moisture contamination to require professional cleaning of this property. That said, the cost of such cleaning and the fact that there were sick children in the home, which denotes a more careful and higher standard of cleaning, warranted disposal of the belongings. It would simply have been too difficult and expensive to save and/or make safe a lot of used family belongings, particularly so for the children's items. All of those had to go.

In addition to the documents cited herein, I also rely on and will cite from passages contained in the American Conference of Governmental Industrial Hygienists', Bioaersols, Assessment and Control, (1999) and the Institute of Inspection, Cleaning and Restoration Certification, IICRC Standard and Reference Guide for Professional Water (1999) and Mold (2003) Damage Restoration, S500 and S520, both adopted by Virginia as Professional Standards for Remediation; Institute of Medicine of the National Academies, Damp Indoor Spaces and Health, National Academies Press, Washington, DC 2004; and the World Health Organization treatise on damp indoor spaces, Guidelines for Indoor Air Quality: Dampness and Mould, 2009. Virginia, by statute<sup>1</sup>, has adopted most of these documents as authoritative sources of guidance in the field of mold evaluation and remediation.

My opinions are rendered to a reasonable degree of certainty in my professional fields and to a degree of more likely than not.

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Respectfully submitted,

*R Leonard Vance*

R. Leonard Vance, Ph.D., PE, CIH  
Associate Professor

1. § 8.01-226.12, Code of Virginia: "Mold remediation in accordance with professional standards" means mold remediation of that portion of the dwelling unit or premises affected by mold, or any personal property of the tenant affected by mold, performed consistent with guidance documents published by the United States Environmental Protection Agency, the United States Department of Housing and Urban Development, the American Conference of Governmental Industrial Hygienists (the Bioaerosols Manual), Standard Reference Guides of the Institute of Inspection, Cleaning and Restoration for Water Damage Restoration and Professional Mold Remediation, or any protocol for mold remediation prepared by an industrial hygienist consistent with said guidance documents.